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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,358	04/12/2004	Ali Shajii	56231-457 (MKS-143)	3068
Toby H. Kusner McDERMOTT, WILL & EMERY 28 State Street Boston, MA 02109				
EXAMINER ZERVIGON, RUDY				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
09/17/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/822,358

**Applicant(s)**

SHAJII ET AL.

**Examiner**

Rudy Zervigon

**Art Unit**

1792

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 21-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-11, and 21-30 are rejected under 35 U.S.C. 102(e) as anticipated by Nawata, Tokuhide et al. (US 20040244837 A1) in view of Ohmi; Tadaihiro et al. (US 6193212 B1). Nawata teaches a system (Figure 1) for delivering a desired mass of gas ("from process gas source"; Figure 1), comprising: a chamber (13; Figure 1); a first valve (12; Figure 1) controlling gas ("from process gas source"; Figure 1) flow into the chamber (13; Figure 1); a second valve (17; Figure 1) controlling gas ("from process gas source"; Figure 1) flow out of the chamber (13; Figure 1); a pressure transducer (14; Figure 1) providing measurements of pressure within the chamber (13; Figure 1); an input device (19; Figure 1) for providing a desired mass of gas ("from process gas source"; Figure 1) to be delivered from the system (Figure 1); a controller (19; Figure 1) connected to the valves, the pressure transducer (14; Figure 1) and the input device (19; Figure 1) and programmed to, receive the desired mass of gas ("from process gas source"; Figure 1) through the input device (19; Figure 1), close the second valve (17; Figure 1); open the first valve (12; Figure 1); receive chamber (13; Figure 1) pressure measurements from the pressure transducer (14; Figure 1); close the first valve when pressure within the chamber (13; Figure 1) reaches a predetermined level; wait a predetermined waiting period to allow the gas ("from process gas source"; Figure 1) inside the chamber (13; Figure 1) to approach a state of equilibrium; open the second valve at  $\text{time} = t_0$ ; and close the second valve at  $\text{time} = t^*$  when the mass of gas ("from process gas source"; Figure 1) discharged equals the desired mass, – claim 1

Nawata further teaches:

- i. A system (Figure 1) according to claim 1, wherein the mass discharged .DELTA.m is equal to,  $\text{.DELTA.m} = m(t_0) - m(t^*) = V/R[(P(t_0)/T(t_0)) - (P(t^*)/T(t^*))]$  (5) wherein  $m(t_0)$  is the mass of the gas ("from process gas source"; Figure 1) in the delivery chamber (13; Figure 1) at time= $t_0$ ,  $m(t^*)$  is the mass of the gas ("from process gas source"; Figure 1) in the delivery chamber (13; Figure 1) at time= $t^*$ ,  $V$  is the volume of the delivery chamber (13; Figure 1),  $R$  is equal to the universal gas ("from process gas source"; Figure 1) constant (8.3145 J/mol K),  $P(t_0)$  is the pressure in the chamber (13; Figure 1) at time= $t_0$ ,  $P(t^*)$  is the pressure in the chamber (13; Figure 1) at time= $t^*$ ,  $T(t_0)$  is the temperature in the chamber (13; Figure 1) at time= $t_0$ ,  $T(t^*)$  is the temperature in the chamber (13; Figure 1) at time= $t^*$ , as claimed by claim 2
- ii. A system (Figure 1) according to claim 2, further comprising a temperature probe (15; Figure 1) secured to the delivery chamber (13; Figure 1) and connected to the controller (19; Figure 1), wherein the temperature probe (15; Figure 1) directly provides  $T(t_0)$  and  $T(t^*)$  to the controller (19; Figure 1), as claimed by claim 3
- iii. A system (Figure 1) according to claim 3, further comprising a temperature probe (15; Figure 1) secured to the delivery chamber (13; Figure 1) and connected to the controller (19; Figure 1) and wherein  $T(t_0)$  and  $T(t^*)$  are calculated using:  $dT/dt = (\rho_{\text{sub.STP}}/\rho_{\text{sub.V}})Q_{\text{sub.out}}(\gamma - 1)T + (\text{Nu.kappa}/l)(A_{\text{sub.w}}/V - \text{sub.v.rho.})_{\text{sub.w-T}}$  (3) where  $\rho_{\text{sub.STP}}$  is the gas ("from process gas source"; Figure 1) density under standard temperature and pressure (STP) conditions,  $\rho_{\text{sub.V}}$  equals the density of the gas ("from process gas source"; Figure 1),  $V$  is the volume of the

chamber (13; Figure 1),  $Q_{sub.out}$  is the gas ("from process gas source"; Figure 1) flow out of the delivery chamber (13; Figure 1),  $T$  equals absolute temperature,  $\gamma$  is the ratio of specific heats,  $Nu$  is Nusselts number,  $k$  is the thermal conductivity of the gas ("from process gas source"; Figure 1),  $C_{sub.v}$  is the specific heat of the gas ("from process gas source"; Figure 1) under constant volume,  $l$  is the characteristic length of the delivery chamber (13; Figure 1), and  $T_{sub.w}$  is the temperature of the wall of the chamber (13; Figure 1) as provided by the temperature probe (15; Figure 1), as claimed by claim 4

- iv. A system (Figure 1) according to claim 4, wherein the gas ("from process gas source"; Figure 1) flow out of the delivery chamber (13; Figure 1) is calculated using:  $Q_{sub.out} = (V/\rho_{sub.STP})[(1/RT)(d\rho/dt) - (P/RT^2)(dT/dt)]$  (4), as claimed by claim 5
- v. A system (Figure 1) according to claim 1, wherein the predetermined level of pressure is provided through the input device (19; Figure 1), as claimed by claim 6
- vi. A system (Figure 1) according to claim 1, wherein the predetermined waiting period is provided through the input device (19; Figure 1), as claimed by claim 7
- vii. A system (Figure 1) according to claim 1, further comprising an output device (19; Figure 1) connected to the controller (19; Figure 1) and the controller (19; Figure 1) is programmed to provide the mass of gas ("from process gas source"; Figure 1) discharged to the output device (19; Figure 1), as claimed by claim 8
- viii. a system (Figure 1) according to claim 1, wherein the chamber is a delivery chamber further comprising a process chamber ("to vacuum vessel"; Figure 1) connected to the

delivery chamber (13; Figure 1) through the second valve (17; Figure 1), as claimed by claim 9

- ix. A system (Figure 1) according to claim 1, wherein the pressure transducer (14; Figure 1) has a response time of about 1 to 5 milliseconds ([0114]), as claimed by claim 10
- x. A system (Figure 1) for delivering a desired quantity of mass of gas ("from process gas source"; Figure 1), comprising: a chamber (13; Figure 1) including an inlet (inlet to chamber 13; Figure 1) and outlet (outlet from chamber 13; Figure 1); an inlet valve (12; Figure 1), connected to the inlet (inlet to chamber 13; Figure 1), configured and arranged so as to control the flow of gas ("from process gas source"; Figure 1) into the chamber (13; Figure 1) through the inlet (inlet to chamber 13; Figure 1); an outlet valve (17; Figure 1), connected to the outlet (outlet from chamber 13; Figure 1), configured and arranged so as to control the flow of gas ("from process gas source"; Figure 1) from the chamber (13; Figure 1) through the outlet (outlet from chamber 13; Figure 1); and a controller (19; Figure 1) configured and arranged to control the inlet and outlet valves so that (a) gas ("from process gas source"; Figure 1) can flow into the chamber (13; Figure 1) until the pressure (as measured from 14; Figure 1) within the chamber (13; Figure 1) reaches a predetermined level, b) the pressure (as measured from 14; Figure 1) of gas ("from process gas source"; Figure 1) within the chamber (13; Figure 1) can reach a state of equilibrium, and c) a controlled amount of mass of the gas ("from process gas source"; Figure 1) can then be measured and allowed to flow from the chamber (13; Figure 1) as a function of a setpoint ("predetermined value"; [0013]) corresponding to a

- desired mass, and the temperature (as measured from 15; Figure 1) and pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1), as claimed by claim 21
- xi. A system (Figure 1) according to claim 21, further including a pressure sensor (14; Figure 1) constructed and arranged so as to provide a pressure (as measured from 14; Figure 1) measurement signal (via 19) to the controller (19; Figure 1) as a function of the pressure (as measured from 14; Figure 1) within the chamber (13; Figure 1), and a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) constructed and arranged so as to provide a temperature (as measured from 15; Figure 1) measurement signal (via 19) to the controller (19; Figure 1) as a function of the temperature (as measured from 15; Figure 1) within the chamber (13; Figure 1), as claimed by claim 22
- xii. A system (Figure 1) according to claim 21, wherein the amount of mass of gas ("from process gas source"; Figure 1) flowing from the chamber (13; Figure 1),  $\Delta m$  at time  $t^*$ , is determined by the controller (19; Figure 1) as follows:  $\{ \}$ , wherein  $m(t^*)$  is the mass of the gas ("from process gas source"; Figure 1) in the chamber (13; Figure 1) at time  $t = t_0$  when the gas ("from process gas source"; Figure 1) within the chamber (13; Figure 1) is at a state of equilibrium,  $m(t^*)$  is the mass of the gas ("from process gas source"; Figure 1) in the chamber (13; Figure 1) at time  $t = t^*$ ,  $V$  is the volume of the chamber (13; Figure 1),  $R$  is equal to the ideal gas ("from process gas source"; Figure 1) constant,  $P(t_0)$  is the pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1) at time  $t = t_0$ ,  $P(t^*)$  is the pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1) at time  $t = t^*$ ,  $T(t_0)$  is the temperature (as measured from 15; Figure 1) in the

- chamber (13; Figure 1) at time =  $t_0$ ,  $T(t^*)$  is the temperature (as measured from 15; Figure 1) in the chamber (13; Figure 1) at time  $t^*$ , as claimed by claim 23
- xiii. A system (Figure 1) according to claim 21, wherein the controller (19; Figure 1) is further configured and arranged to control operation of the inlet valve (12; Figure 1) by control commands ([0013]), as claimed by claim 24
- xiv. A system (Figure 1) according to claim 21, wherein the chamber (13; Figure 1) includes a chamber (13; Figure 1) wall, and further comprising a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) configured and arranged to sense a temperature (as measured from 15; Figure 1) of the chamber (13; Figure 1) wall  $T_w$ , and produce a corresponding temperature (as measured from 15; Figure 1) signal, and wherein  $T(t_0)$  and  $T(t^*)$  are the measured temperatures of the chamber (13; Figure 1) wall at times  $t_0$  and  $t^*$ , respectively, as claimed by claim 25
- xv. A system (Figure 1) according to claim 21, wherein the chamber (13; Figure 1) is a delivery chamber (13; Figure 1), and further comprising a process chamber ("To Vacuum Vessel"; Figure 1) connected to the delivery chamber (13; Figure 1) through the outlet valve (17; Figure 1), as claimed by claim 30

Nawata is not specific in teaching the operation of his valves with respect to the computer logic and processing claimed in claims 1-8, and 21-29:

- i. wherein  $t^*$  is from about 100 milliseconds to about 500 milliseconds – claim 1
- ii. wherein for delivery of the mass of gas, the outlet valve is open for a time of about 100 milliseconds to about 500 milliseconds – claim 21

- iii. Nawata does not teach that his second valve (17; Figure 1) has a response time of about 1 to 5 milliseconds.
- iv. A system (Figure 1) according to claim 25, wherein the first valve (12; Figure 1) is configured and arranged so that a controlled amount of mass of the gas ("from process gas source"; Figure 1) can be allowed to flow from the chamber (13; Figure 1) as a function time derivative of the temperature (as measured from 15; Figure 1) {}, as claimed by claim 26

Ohmi teaches a fluid delivery valve (Figure 1) with a response time of "a few milliseconds" (column 3; lines 24-33; Table 1). As a result, operation at the claimed 100 to 500 milliseconds is inherent in Ohmi's fluid delivery valve (Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Nawata's second valve (17; Figure 1) with Ohmi's fluid delivery valve.

Motivation to replace Nawata's second valve (17; Figure 1) with Ohmi's fluid delivery valve is for preventing counter flow as taught by Ohmi (column 2; lines 48-61).

#### ***Response to Arguments***

- 3. Applicant's arguments filed June 23, 2008 have been fully considered but they are not persuasive.
- 4. Applicant arguments (pages 8-16) based on Ashley are moot in view of the rejections withdrawn thereunder.
- 5. Applicant states at page 16:  
..

Furthermore, as was stated previously, Nawata actually teaches away from the elements of claims 1 and 21 by teaching that a pulse shot is completed prior to any pressure measurements for mass calculations and that for short time periods "it is useless to measure the pressure."

“

6. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### *Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1792

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1792 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

/Rudy Zervigon/

Primary Examiner, Art Unit 1792